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SOME NOTES ON THE DIPTEROUS ENEMIES OF APHIDS HARMFUL FOR APPLE GROWING IN NOVA SCOTIA

DOOR

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Some Notes on the Dipterous Enemies of Aphids Harmful for Apple Growing in Nova Scotia

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During a stay at the Research Station, Canada Department of Agriculture at Kentville, Nova Scotia, from July 3 to October 16, 1959, I had the opportunity to make some observations on the natural enemies of the woolly apple aphid, *Eriosoma lanigerum* (Hausm.), the rosy apple aphid, *Dysaphis plantaginea* (Pass.), and the green apple aphid, *Aphis pomi* Deg. An inventory of these enemies was made in the Annapolis Valley in apple orchards, sprayed according to the principles of the spray schedule of Dr. A. D. Pickett. This schedule avoids spraying with fungicides and insecticides such as sulphur and phosphorus compounds, which are very harmful to the enemies of a number of pests, studied by Dr. Pickett and his staff (cf. Pickett 1959). The dipterous predators and their enemies are dealt with in this paper.

Observations

The Dipterous Enemies of the Woolly Apple Aphid

Neocnemodon elongata (Cn.) (Diptera, Syrphidae) was observed as a larva in woolly aphid colonies in several orchards; 14 specimens (nine males and five males) were reared to adults with woolly aphids. The flies emerged between July 30 and September 2. It should be noted that the investigations were started in late July; therefore it may be possible that adults were already present in the field before July 30.

From the puparia the following parasites emerged: *Phthorima bidens* Davis (Hymenoptera, Ichneumonidae) or a closely related species, eight specimens (one from each puparium) emerging between August 7 and 31, and *Lygocerus* sp. (Hymenoptera, Ceraphronidae), 14 specimens (one male and 13 females) emerging from one puparium on August 12.

In Europe a different but related species of syrphid fly, *Neocnemodon vitripennis* (Meig.), acts as a predator of the woolly apple aphid (Evenhuis 1959). It is reasonable to expect, that *Neocnemodon elongata*, like *N. vitripennis*, is restricted in its prey to aphids with dense, flocculent wax secretions, living in dense colonies on trees and shrubs.

Metasyrphus wiedemanni (John.) (Diptera, Syrphidae) was also often observed as a larva in colonies of the woolly apple aphid; 19 specimens (13 males and six females) developed into adults with woolly aphids as prey. The adults emerged between August 24 to October 6. A number of adult flies, however, stayed within the puparia; the temperature probably was too low for emergence in that period. From one of the puparia a parasite, *Syrphoctonus agilis* (Cress.) (Hymenoptera, Ichneumonidae), emerged on October 13.

One specimen of *Syrphus vittafrons* Shan. (Diptera Syrphidae) was reared from the larva with woolly aphids. It was collected at Port Williams; the adult appeared on October 6.

Recapitulating, it may be said that in the summer of 1959 two important Syrphid predators of the woolly apple aphid were present in Nova Scotia, viz. *Neocnemodon elongata*, probably nearly monophagous and present in the field as an adult fly until about September, and *Metasyrphus wiedemanni*, polyphagous and present in the field from the end of August until autumn.

The Dipterous Enemies of the Rosy and the Green Apple Aphid

During the whole season many orange gall midge larvae (*Phaenobremia* sp., Diptera, Cecidomyiidae) were observed in colonies of the green apple aphid. Also a conspicuously coloured, brownish-red Syrphid fly larva (Diptera, Syrphidae) with the extreme fore-part bright red and with yellow light cross stripes on the rest of the body was often observed among green apple aphids. Perhaps it was *Metasyrphus vinelandi* (Cn.), which was bred once by me from a larva, collected from a colony of green apple aphids at Morristown. A parasite, *Aspicera* sp. (Hymenoptera, Cynipidae), which emerged from a puparium of this species, was also collected in a colony of the green apple aphid at Morristown.

Small dipterous larvae were observed in great quantities, especially at the end of July and the beginning of August, in colonies of the rosy apple aphid on the undersides of the curled leaves and particularly on the leaves and twigs infested with green apple aphids. Some were reared to the adult stage, mostly by keeping the leaves and twigs with aphids and dipterous larvae in plastic bags in the laboratory for some days. The full-grown larvae often crawl to the plastic to make their puparia. These puparia were collected in glass vials; the adults emerged about a week later. Two species, viz., *Leucopis americana* Malloch and *Leucopis* sp. (Chamaemyiidae) were bred from both aphids, the latter species probably is a new one.

According to Mr. McAlpine the puparia of both species may be easily distinguished; the puparium of *L. americana* being pale yellowish-brown in colour and bearing very numerous, short, fine papillae and that of *Leucopis* sp. being dark reddish brown with the papillae much sparser and coarser.

From one puparium a parasite, *Melanips* sp. (Hymenoptera, Cynipidae), emerged.

Both *Leucopis* species probably are important predators of both the rosy and the green apple aphids.

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